HP StorageWorks

FC1143 and FC1243 4Gb PCI-X 2.0 host bus adapters for Linux and Windows

installation guide

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About this guide

This guide provides information about:

- Installing and configuring the FC1143 and FC1243 4Gb PCI-X 2.0 HBAs
- Contacting technical support for additional assistance

Intended audience

This guide is intended for system administrators who are familiar with:

- Linux® oerating systems
- Microsoft® Window® operating systems
- host bus adapter (HBAs)

Related documentation

In addition to this guide, see the *QLogic host bus adapters for x86 and x64 Linux and Windows, and x86 NetWare release notes*.

Other HP documents are available on the HP web site: http://www.docs.hp.com.

Document conventions and symbols

Table 1 Document conventions

Convention	Element
Medium blue text: Related documentation	Cross-reference links and e-mail addresses
Medium blue, underlined text (http://www.hp.com)	Web site addresses
Bold font	- Key names - Text typed into a GUI element, such as into a box - GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes
Italic font	Text emphasis
`Monospace font`	- File and directory names - System output - User input - Code - Text typed at the command line
`Monospace, italic font`	- Code variables - Command-line variables

⚠ **WARNING!**

Indicates that failure to follow directions could result in bodily harm or death.

△ CAUTION:

Indicates that failure to follow directions could result in damage to equipment or data.

☑ IMPORTANT:

Provides clarifying information or specific instructions.

☑ NOTE:

Provides additional information.

☼ TIP:

Provides helpful hints and shortcuts.

HP technical support

Telephone numbers for worldwide technical support are listed on the HP support web site: http://www.hp.com/support/.

Collect the following information before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

Helpful web sites

For other product information, see the following HP web sites:

- http://www.hp.com
- http://www.hp.com/go/storage
- http://www.hp.com/support/
- http://www.docs.hp.com

Subscription service

HP strongly recommends that customers register online using the Subscriber's choice web site: http://www.hp.com/go/e-updates.

Subscribing to this service provides you with e-mail updates on the latest product enhancements, newest driver versions, and firmware documentation updates, as well as instant access to numerous other product resources.

After subscribing, locate your products by selecting **Business Support Center** and then **Storage** under Product Category.

1 HBA features

This chapter describes the features of the FC1143 single-port HBA (product number AB429A) and FC1243 dual-port HBA (product number AE369A).

Performance specifications

The FC1143 and FC1243 HBAs are 4Gb PCI-X 2.0 high-performance direct memory access (DMA) bus master HBAs designed for high-end systems.

These HBAs have the following features:

- Combines a powerful reduced instruction set computing (RISC) processor, a Fibre Channel protocol manager (FPM) with 4Gb Fibre Channel transceivers, and a peripheral component interconnect (PCI) or peripheral component interconnect-extended (PCI-X) local bus interface in a single-chip solution
- Supports Fabric Loop Attach (FLA) connections
- Supports bus master DMA
- Supports SCSI-3 Fibre Channel Protocol (SCSI-FCP), and Fibre Channel-Virtual Interface (FC-VI) protocols
- Supports point-to-point fabric connection (F-PORT FABRIC LOGIN)
- Complies with:
  - PCI Local Bus Specification revision 2.3
  - PCI-X Protocol Addendum to the PCI Local Bus Specification, revision 2.0a
  - PCI-X Electrical and Mechanical Addendum (revision 2.0a) to the PCI Local Bus Specification
  - PCI Bus Power Management Interface Specification revision 1.1
  - PCI Hot Plug Specification, revision 1.0PCI-X Addendum (revision 1.0) to the PCI Local Bus Specification
  - Third-generation Fibre Channel–Physical and Signaling Interface (FC-PH) standard
  - Fibre Channel-Arbitrated Loop (FC-AL-2) standard
  - Fibre Channel Framing and Signaling (FC-FS)
  - U.S. and international safety and emissions standards

Environmental specifications

Table 2 lists the HBA environmental specifications.

Table 2 HBA environmental specifications

Environment	Minimum	Maximum
Operating temperature	0 °C/32 °F	55 °C/131 °F
Storage temperature	-20 °C/-4 °F	70 °C/158 °F
Relative humidity (noncondensing)	10%	90%
Storage humidity (noncondensing)	5%	95%

Physical specifications

Table 3 lists the HBA specifications.

Table 3 HBA specifications

Type	Specification
Bus interface	64-bit, PCI-X 2.0 266-MHz DDR, compatible with 66/33-MHz PCI and 133/100/66-MHz PCI-X Conforms to *PCI Local Bus Specification, revision 2.3, PCI Bus Power Management Interface Specification, revision 1.1, PCI Hot Plug Specification, revision 1.0*
Fibre Channel specifications	Bus type: fiber optic media Bus transfer rate: 4Gb/s FC increases aggregate throughput rate to 800 MBps in full-duplex mode
Central processing unit (CPU)	Single-chip design that includes a RISC processor, Fibre Channel protocol manager, PCI-XDMA controller, integrated serializer/deserializer (SEREDES), and electrical transceivers that can autonegotiate a data rate of 4 Gb/s.
Memory	1-MB SRAM, 1-MB flash (SPI), and 2-KB NVRAM (SPI)
Signal voltage	3.3 V (mode 1), 3.3 V/1.5 V (mode 2)
Data rate	4, 2, 1 Gb/s auto-negotiation (4.2480/2.1240/1.0625 Gb/s)
Onboard DMA	Five-channel DMA controller: two data and one command, one auto-DMA request, and one auto-DMA response.
Frame Buffers	Integrated 10-KB frame buffer FIFOs (6-KB receive and 4-KB transmit) for each data channel.
Ports	Single or Dual 4 Gb/s
Connectors	Small-form-factor fixed (SFF) multimode optic with LC connector
Form factor	Low-profile MD2: 16.93 cm × 5.15 cm (6.7 in. × 2.5 in.)
Bracket size	Standard: 1.84 cm × 12.08 cm (0.73 in. × 4.76 in.) Low-profile: 1.84 cm × 8.01 cm (0.73 in. × 3.15 in.)
Power consumption	~11.0 Watts

2 Installing the HBAs

This chapter describes the procedure for installing the FC1143 and FC1243 HBAs, including:

- Installation prerequisites, page 13
- Installation procedure, page 14

Refer to your host documentation for installing the HBAs.

⚠ WARNING!

Disconnect the host from the power source before installing the HBAs. To reduce the risk of personal injury from hot surfaces, allow the internal server or workstation components to cool before touching.

△ CAUTION:

Electrostatic discharge (ESD) can damage electronic components. Be sure you are properly grounded before beginning this procedure as described in "Regulatory compliance and safety" on page 29.

Installation prerequisites

Before you begin, ensure that you have:

- An optical multimode cable with an LC-style duplex connector
- An empty PCI-X slot
- The following unique information that is located on the bottom of the HBA:
  - Serial number
  - World Wide Port Name (WWPN) and Node Name (NN), each of which is derived from the HBA's IEEE address. Combined, the WWPN and NN create the World Wide Name (WWN) that uniquely identifies an HBA in the Fibre Channel environment

Installation procedure

To install the HBA:

1. Check the motherboard and make any necessary configuration changes to accommodate the HBA.
2. Power down the peripherals, and then turn off the computer.
3. Disconnect the power cable.
4. Remove the computer cover and save the screws.
5. Locate the appropriate bus slot. The connector for the slot looks like the connector in Figure 1.

Figure 1 PCI-X 2.0 connector

6. Remove the slot cover for the slot in which you will install the HBA.
7. Place the HBA in the slot and carefully press the board into the slot until it seats firmly.
8. Secure the HBA to the chassis following the server manufacturer's instructions.
9. Connect the appropriate cable from the devices to the corresponding LC-connector.
10. Close and tighten the computer cover.
11. Plug in the power cable.
12. Power up all external FC devices, then power up the server and observe the monitor and the LED indicators described in "LED indicators " on page 15 to ensure proper operation.

LED indicators

Table 4 identifies and describes the activity of the LED indicators.

Table 4 LED indicators activity

Yellow LED	Green LED	Amber LED	Activity
Off	Off	Off	Power off
On	On	On	Power on before or after firmware initialization
Flashing	Flashing	Flashing	Power on after firmware initialization
Alternately flashing	Alternately flashing	Alternately flashing	Firmware fault
Off	Off	Flashing	Activity at 1Gb
Off	Flashing	Off	Activity at 2Gb
Flashing	Off	Off	Activity at 4Gb
Flashing	Off	Flashing	Beacon

3 Installing and configuring the Linux driver

This chapter provides instructions for installing the Linux qla2*xxx* (The *xxx*is the kit date string) driver for an FC1143 or FC1243 HBA on an already installed Red Hat™ Enterprise Linux (Red Hat EL) or SUSE® Linux Enterprise Server (SUSE SLES) system.

You can obtain the software kit for the driver from the following HP web site: http://h18006.www1.hp.com/storage/saninfrastructure.html.

To install the driver, you must be familiar with the operating system under which the HBA is to operate, and have access to standard system documentation.

To install the driver, use the procedures and information in the following sections:

- Installing the driver kit, page 17
- Using the RPM, page 18

To use Linux HBA utilities, use the use the procedures and information in the following sections:

- Changing driver parameters, page 18
- EFI driver utilities, page 18
- Proc file system support, page 18
- Using fibreutils, page 19
- Using FLASUTIL, page 20
- Using Fast!Util, page 22

Installing the driver kit

HP recommends that you install the complete driver kit for this HBA. The kit contains the driver and utilities you need to deploy this HBA on Linux.

> **NOTE:**
> You must install the gcc compiler and the kernel sources or kernel development packages on your system before installing the driver kit.

To install the complete HP driver kit, copy the `.gz` file to your system and enter the following commands:

```
# tar -zxvf hp_qla2x00-xxx.tar.gz
# cd hp_qla2xxx
# ./INSTALL
```

The *xxx* is the kit date string.

Refer to the `README` file included with the driver kit for more information.

Using the RPM

The RPM Package Manager (RPM) is a package management system that lets you easily install Linux software. Using RPM, you can install software in prebuilt bundles called RPM packages.

This section is included for reference only. See this section for future separate RPM installations you may need.

For example:

- To install the RPM, copy the RPM package file to your system and enter the following command:

  `# rpm -ivh package_name.rpm`
- To manually install the Linux HBA driver RPM, enter the following command:

  `# rpm -ivh hp_qla2xxx.rpm`
- To upgrade the RPM, copy the RPM package file to your system and enter the following command:
  - For Red Hat EL, enter:

    `# rpm -Uvh --nopostun --nopreun package_name.rpm`
  - For SUSE SLES:

    `# rpm -Uvh package_name.rpm`
- To uninstall the RPM package, enter the following command:

  `# rpm -e package_name.rpm`

Changing driver parameters

To change driver parameters:

1. Run the `set_parm` script located in the `/opt/hp/src…` `directory`.

2. Reboot the server.

> **NOTE:**
>
> You must reboot. Otherwise, the qla2xxx driver may not unload if there is a process or file system using a device that is attached to the HBA.

EFI driver utilities

The EFI driver utilities let you load the EFI drivers included with the `fibreutils` RPM. See the EFI driver information files for detailed information about using these drivers.

Proc file system support

The `/proc` file system for the qla2xxx driver is located in the `/proc/scsi/qla2xxx/` directory. This directory contains entries for each SCSI HBA channel in the system. Each entry presents information about the adapter and transfer statistics for each discovered LUN.

Using fibreutils

This section describes how to install and use `fibreutils`. Use this utility to manage Fibre-attached storage. The `fibreutils` utility performs the following:

- Gathers system information
- Lists information about HBAs in the target server
- Lists sd and sg device information
- Loads the latest EFI drivers
- Rescans for new devices

Installing the fibreutils RPM

HP recommends installing the `fibreutils` RPM found in the driver kit. It contains utilities for managing Fibre-attached storage. To manually install this RPM, enter:

`# rpm -ivh fibreutils-version.rpm`

To uninstall the `fibreutils` RPM, enter:

`rpm -e fibreutils`

fibreutils RPM contents

The `fibreutils` RPM contains utilities and EFI drivers and installs them in the following directories:

- The utilities reside in `/opt/hp/hp_fibreutils`.
- The EFI files reside in:
  - Red Hat Linux: `/boot/efi/efi/qla2x00`
  - SUSE Linux: `/boot/efi/qla2x00`
  - The QLogic EFI driver resides in the `qla` directory.

fibreutils commands

`fibreutils` comprises command files that reside in the `/opt/hp/hp_fibreutils` directory.

These command files link to the `/usr/sbin` directory, enabling you to invoke them from anywhere.

Table 5 describes the `fibreutils` commands.

Table 5 fibreutils commands

Command	Description
adapter_info	Lists useful information about HBAs in the system. Use the `-h` option to list other switches.
hp_rescan	Forces the QLA HBAs and the SCSI midlayer (`scsi_mod.o`) to rescan for LUNs on all adapters or a particular adapter instance. Use the `-h` option to list other switches.
hp_system_info	Gathers information on the current system and packages it into a compressed `tar` file.
lssd	Lists all sd devices with instance, channel, bus, and LUN information, SCSI product ID, firmware level, WWNN and INQUIRY page 0x83 UUID information. Use the `-h` option to list other switches.
lssg	List all sg devices with instance, channel, bus and LUN information, SCSI product ID, firmware level, WWNN and INQUIRY page 0x83 UUID information. Use the `-h` option to list other switches.
probe-luns	Forces the SCSI midlayer module (`scsi_mod.o`) to rescan LUNs 0-32 for targets attached to HBAs. Use the `-h` option to list other switches. See "Starting probe-luns at system boot time" on page 20 for more information.
scsi_info	Shows inquiry information for a specific SCSI device

Starting probe-luns at system boot time

In some cases, specifically, if a device is not in the SCSI blacklist or device list, a probe must be forced at a specific host, channel, ID, or LUN to find a LUN. Running `probe-luns` at system boot can solve this issue.

To start `probe-luns` at system boot, the appropriate code resides in the `pbl_inst.sh` script in the `/opt/hp/hp_fibreutils/pbl` directory.

To install the `probe-luns` startup code, enter:

```
# cd /opt/hp/hp_fibreutils/pbl
# ./pbl_inst.sh -i
```

Using FLASUTIL

`FLASUTIL` is a Flash and NVRAM Programming DOS utility. The following table describes the command line options.

Note the following about `FLASUTIL` options:

- The options apply only to the associated component. For example, you cannot use an command option for Boot Code image for Fcode image.
- In the following options, *xxxx* is the HBA address. If no address is specified, the option applies to all HBAs.

Table 6 FLASUTIL commands

Component	Option	Description
Boot Code image	/F *xxxx*	Writes BIOS Flash. If the flash contains a valid BIOS, the existing NVRAM defaults do not change.
	/C *xxxx*	Verifies the BIOS Flash of the specified HBA.
	/W*xxxx*	Copies the BIOS Flash to the `QL1xROM.SAV` file.
Fcode image	/FF*xxxx*	Writes FCode flash for the specified HBA address.
	/CF*xxxx*	Verifies Fcode of the specified HBA.
RISC code image	/FR*xxxx*	Writes RISC code to Flash at the specified HBA address.
	/CR*xxxx*	Verifies the RISC code of the specified HBA.
	/WR*xxxx*	Copies the RISC code from Flash to a file.
1M complete flash image	/FB*xxxx*	Verifies the 1Mb combined image in Flash.
	/CB*xxxx*	Writes 1Mb combined image to Flash.
	/WB*xxxx*	Copies 1Mb image from Flash to a file.
	/I	Ignores Subsystem ID.
	/M	Does not prompt for I/O address.
	/O *filename.ext*>	Uses *filename.ext* instead of `QLxxRXX.BIN` file.
	/Q	Does not display messages.
	/S *xxxx*	Displays the serial number of the specified HBA.
	/U *xxxx*	Updates the NVRAM defaults in the BIOS for the specified HBA. If the SSVID/SSID in the NVRAM files do not match those in the NVRAM, the NVRAM and the BIOS are not updated.
	/V *xxxx*	Displays the current BIOS version for the specified HBA.
	/VR *xxxx*	Displays the current RISC version for the specified HBA.
	/Y *xxxx*	Displays the Port Name of the specified HBA.
NVRAM	/D *xxxx*	Copies NVRAM to the `QL1xNVRM.SAV` file for the specified HBA.
	/L *xxxx*	Writes NVRAM for the specified HBA.
	/N *filename.ext*>	Uses *filename.ext* instead of `NVRMxxx.DAT` file.
	/X *xxxx*	Verifies the NVRAM for the specified HBA.

Table 7 shows FLASUTIL command examples.

Table 7 FLASUTIL command examples

Purpose	Command	Description
Write flash in all QLogic HBAs in a system without being prompted for I/O address	`flasutil /f`	Updates the BIOS while preserving previous NVRAM defaults.
Write the RISC code in all HBAs	`flasutil /fr`	Updates the RISC code for all HBAs
Write NVRAM and change defaults in the BIOS	`flasutil /u`	Writes the NVRAM and updates the BIOS defaults
Write NVRAM without updating the BIOS defaults in all HBAs in a system without being prompted for the I/O address	`flasutil /l`	Updates the NVRAM (the existing SSID/SSVID in the NVRAM need to match those in the provided NVRAM files)
Write NVRAM and update BIOS defaults using a custom NVRAM file.	`flasutil /u /n mynvram.dat`	Writes NVRAM and update BIOS defaults writing the NVRAM to *mynvram.dat*.

Using Fast!UTIL

This section provides detailed configuration information for advanced users who want to customize the configuration of an HBA and the connected devices.

Use *Fast!*UTIL, HP's BIOS-resident configuration tool to customize the HBA's configuration. Access *Fast!*UTIL by pressing **ALT+Q** during the HBA BIOS initialization (it may take a few seconds for the *Fast!* UTIL Options menu to display). If you have more than one HBA, *Fast!*UTIL prompts you to select the HBA you want to configure. After changing the settings and exiting the utility, *Fast!*UTIL reboots your system to load the new parameters.

△ CAUTION:
If the configuration settings are incorrect, your HBA may not function properly.

The following sections describe the *Fast!*UTIL options.

Configuration Settings

The first selection on the *Fast!*UTIL Options menu is Configuration Settings. These settings configure the Fibre Channel devices and the HBA to which they are attached.

Adapter Settings

From the **Configuration Settings** menu in *Fast!*UTIL, select **Adapter Settings**. Table 8 lists the default settings for the HBA:

Table 8 Adapter Settings

Setting	Options	Default
Host Adapter BIOS	Enabled, Disabled	Disabled
Frame Size	512, 1024, 2048	2048
Loop Reset Delay	0–60 seconds	5
Adapter Hard Loop ID	Enabled, Disabled	Disabled
Hard Loop ID	0–125	0
Spin Up Delay	Enabled, Disabled	Disabled
Connection Options	0, 1, 2	2
Fibre Channel Tape Support	Enabled, Disabled	Enabled
Data Rate	0, 1, 2, 3	2

The following section describes the settings:

- **Adapter BIOS**—When this setting is Disabled, the ROM BIOS on the HBA is disabled, freeing space in upper memory. This setting must be enabled if you are booting from an FC hard disk attached to the HBA. The default is Disabled.
- **Frame Size**—Sspecifies the maximum frame length supported by the HBA. The default size is 2048, which provides maximum performance for F-Port (point-to-point) connections.
- **Loop Reset Delay**—After resetting the loop, the firmware refrains from initiating any loop activity for the number of seconds specified in this setting. The default is 5 seconds.
- **Adapter Hard Loop ID**—Forces the adapter to attempt to use the ID specified in the Hard Loop ID setting. The default is Disabled.
- **Hard Loop ID**—If the Adapter Hard Loop ID setting is enabled, the adapter attempts to use the ID specified in this setting. The default ID is 0.
- **Spin Up Delay**—When set, the BIOS waits up to two minutes to find the first drive. The default is Disabled,
- **Connection Options**—Defines the type of connection. The default is 2. The options are:
  - 0: loop
  - 1: point-to-point
  - 2: loop preferred, then point-to-point
- **Fibre Channel Tape Support**—Enables FCP-2 recovery. The default is Enabled.
- **Data Rate**—Determines the data rate. The default is 2. The options are:
  - 0: 1 Gb/s
  - 1: 2 Gb/s
  - 2: Auto-negotiates and determines the data rate.
  - 3: 4 Gb/s

Selectable Boot Settings

This option enables you to select the node name from which you want to boot. Once enabled, this option forces the system to boot on the selected FC hard disk, ignoring any IDE hard disks attached to your system. If you disable this option, the system looks for a boot device (as selected in the system BIOS). In disabled mode, the Boot ID and Boot LUN parameters have no effect.

Some new system BIOS support selectable boot, which supersedes the *Fast!*UTIL selectable boot setting. To boot from an FC hard disk attached to the HBA, select the HBA Fibre Channel hard disk on the system BIOS.

NOTE:
This option applies only to hard disks; it does not apply to tape drives and other nondisk devices.

Restore Default Settings

This option restores the HBA default settings.

Raw NVRAM Data

This option displays the HBA's NVRAM contents in hexadecimal format. This is a troubleshooting tool; you cannot modify the data.

Advanced Adapter Settings

From the **Configuration Settings** menu in *Fast!*UTIL, select **Advanced Adapter Settings**. Table 9 lists the default settings for the HBA:

Table 9 Advanced Adapter Settings

Setting	Options	Default
Execution Throttle	1–256	16
Luns per Target	0, 8, 16, 32, 64, 128, 256	128
Enable LIP Reset	Yes, No	No
Enable LIP Full Login	Yes, No	Yes
Enable Target Reset	Yes, No	Yes
Login Retry Count	0–255	8
Port Down Retry Count	0–255	16
Link Down Timeout	0–255	30
Operational Mode	0, 5, 6	0
Interrupt Delay Timer	0–255	0

The following section describes the settings:

- **Execution Throttle**—Specifies the maximum number of commands executing on any one port. When a port's execution throttle is reached, no new commands are executed until the current command finishes executing. The valid options for this setting are 1–256. The default is 16.
- **LUNs per Target**—Specifies the number of LUNs per target. Multiple LUN support is typically for RAID boxes that use LUNs to map drives. The default is 8. If you do not need multiple LUN support, set the number of LUNs to 0.
- **Enable LIP Reset**—Determines the type of loop initialization process (LIP) reset that is used when the operating system initiates a bus reset routine. When this setting is Yes, the driver initiates a global LIP reset to clear the target device reservations. When this setting is No, the driver initiates a global LIP reset with full login. The default is No.
- **Enable LIP Full Login**—Instructs the ISP chip to re-login to all ports after any LIP. The default is Yes.
- **Enable Target Reset**—Enables the drivers to issue a Target Reset command to all devices on the loop when a SCSI Bus Reset command is issued. The default is Yes.
- **Login Retry Count**—Specifies the number of times the software tries to log in to a device. The default is 8 retries.
- **Port Down Retry Count**—Specifies the number of times the software retries a command to a port returning port down status. The default is 8 retries.

- **Link Down Timeout**—Specifies the number of seconds the software waits for a link down to come up. The default is 30.
- **Operational Mode**—Specifies the reduced interrupt operation (RIO) modes, if supported by the software driver. The RIO modes allow posting multiple command completions in a single interrupt. The default is 0. The modes are:
  - 0: Interrupt for every I/O completion
  - 5: Interrupt when Interrupt Delay Timer expires
  - 6: Interrupt when Interrupt Delay Timer expires or no active I/Os
- **Interrupt Delay Timer**—Contains the value (in 200-microsecond increments) used by a timer to set the wait time between generating an interrupt. The default is 0.

Scan Fibre Devices

This option scans the FC loop and lists all the connected devices by loop ID. Information about each device is listed, for example, vendor name, product name, and revision. This information is useful when configuring your HBA and attached devices.

Fibre Disk Utility

This option scans the FC loop and lists all the connected devices by loop ID. You can select a hard disk and perform a low-level format or verify the hard disk.

△ CAUTION:

Performing a low-level format destroys all data on the hard disk.

Select Host Adapter

If you have multiple HBAs in your system, use this setting to select and then configure or view the settings of a specific HBA.

Troubleshooting Linux

For troubleshooting Linux driver-related information, check the `/var/log/messages` file. If the qla2*xxx* driver detects any fabric or driver events, the information about these events reside in this file.

4 Installing the Windows drivers

This chapter describes how to install the Windows Storport miniport driver, including the following topics:

- Prerequisites, page 27
- Installing drivers using the Smart Component, page 27
- Troubleshooting Windows, page 28

Prerequisites

Perform the following tasks before you install the drivers:

- Prior to installing or updating drivers, obtain the *QLogic host bus adapters for x86 and x64 Linux and Windows, and x86 NetWare release notes,* which are available from the HP web site: http://h18006.www1.hp.com/storage/saninfrastructure.html.
- Obtain the HP Smart Component kit with the latest drivers from the HP web site: http://h18006.www1.hp.com/storage/saninfrastructure.html.
- Be familiar with the operating system under which the HBA is to operate, and have access to standard system documentation.
- Review any restrictions or mandatory hot fixes that apply to your configuration and operating system.

Installing drivers using the Smart Component

To install HBA Windows drivers, obtain the latest Smart Component for your configuration and copy it to your Windows desktop. Double-click the Smart Component executable to begin the installation, and then click **Install**. The installation completes automatically.

📝 **NOTE:**

If you are performing a driver upgrade, HP recommends that, prior to launching the installation, you verify that the current driver parameter values match those in described in the *QLogic host bus adapters for x86 and x64 Linux and Windows, and x86 NetWare release notes.* If there are any discrepancies, launch the Smart Component using the command prompt window.

To launch the Smart Component in the command prompt window:

1. Open a command prompt window. Enter **Start > Run > cmd**.

2. Use the cd command to set the current directory to the folder containing the Smart Component bug fixes for the Storport miniport driver.

3. Enter the following command:

   `cp00xxxx.exe /X`

   The *xxxx* is the numerical value in the Smart Component's name. This command installs the new driver and ensures that all registry parameters associated with the driver are using QLogic defaults or HP-supported values.

   For more information about Smart Component installation options, see the `QLS***Readme.txt` file. To obtain a copy of this document, double-click the Smart Component executable, then click **Extract** to place a copy of all Smart Component files in the folder you select.

Troubleshooting Windows

This section describes how to use the Windows Event Viewer to troubleshoot Windows drivers.

Using the Event Viewer

The miniport drivers verify the condition of the HBA's POST LED states. If there is a failure or a suspected failure, an error log entry appears in the Windows Event Log. Use the Event viewer to access the Event log

To open the Event Viewer:

1. Click **Start > Programs > Administrative Tools >Event Viewer**, or right-click **My Computer** and select **Manage**.

2. Click **Event Viewer** in Computer Management.

   The Event Viewer window appears.

3. See the following web site for information about interpreting the event codes: http://www.qlogic.com/support/logs/evlogV9xxx_error.asp.

A Regulatory compliance and safety

Declaration of conformity for products marked with the FCC logo, United States only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. For questions regarding your product, visit http://www.hp.com. For questions regarding this FCC declaration, contact us by mail or telephone:

- Hewlett-Packard Company, P.O. Box 692000, Mailstop 510101 Houston, TX 77269–2000
- 1–281–514–3333

To identify this product, refer to the part, Regulatory Model Number, or product number found on the product.

Laser device

All HP systems equipped with a laser device comply with safety standards, including International Electrotechnical Commission (IEC) 825. With specific regard to the laser, the equipment complies with laser product performance standards set by government agencies as a Class1 laser product. The product does not emit hazardous light.

Laser safety warning

⚠ **WARNING!**

To reduce the risk of exposure to hazardous radiation:
- Do not try to open the laser device enclosure. There are no user-serviceable components inside.
- Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.
- Allow only HP-authorized service technicians to repair the laser device.

Certification and classification information

This product contains a laser internal to the fiber optic (FO) transceiver for connection to the Fibre Channel communications port.

In the USA, the FO transceiver is certified as a Class 1 laser product conforming to the requirements contained in the Department of Health and Human Services (DHHS) regulation 21 CFR, Subchapter J. A label on the plastic FO transceiver housing indicates the certification.

Outside the USA, the FO transceiver is certified as a Class 1 laser product conforming to the requirements contained in IEC 825-1:1993 and EN 60825-1:1994, including Amendment 11:1996 and Amendment 2:2001.

Laser product label

The optional label in Figure 2 or equivalent may be located on the surface of the HP-supplied laser device.

Figure 2 Class 1 laser product label

International notices and statements

Canadian notice (avis Canadien)

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union notice

Products bearing the CE marking comply with the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community, and if this product has telecommunication functionality, the R&TTE Directive (1999/5/EC).

Compliance with these directives implies conformity to the following European Norms (in parentheses are the equivalent international standards and regulations):

- EN55022 (CISPR 22)—Electromagnetic Interference
- EN55024 (IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8, IEC61000-4-11)—Electromagnetic Immunity
- Power Quality:
  - EN61000-3-2 (IEC61000-3-2)—Power Line Harmonics
  - EN61000-3-3 (IEC61000-3-3)—Power Line Flicker
- EN60950 (IEC60950)—Product Safety
- Also approved under UL 60950/CSA C22.2 No. 60950-00, Safety of Information Technology Equipment

BSMI (Taiwan)

警告使用者:

這是甲類的資訊產品，在居住的
環境中使用時，可能會造成射頻
干擾，在這種情況下，使用者會
被要求採取某些適當的對策。

Figure 3 BSMI (Taiwan) notice

Japanese notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文を
お読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準
に基づくクラスB情報技術装置です。この装置は、家庭環境で使用すること
を目的としていますが、この装置がラジオやテレビジョン受信機に近接して
使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に
基づくクラスA情報技術装置です　この装置を家庭環境で使用すると電波
妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ず
るよう要求されることがあります。

Figure 4 Japanese notice

Korean notice

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니
판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약
잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기
바랍니다.

Figure 5 Korean notice

Electrostatic discharge

To prevent damage to the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- To avoid hand contact, transport and store products in static-safe containers.
- Keep static-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly (see "Grounding methods" on page 32).

Grounding methods

There are several methods for grounding. Use one or more of the following methods when handling or installing static-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm (±10 percent) resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the recommended equipment for proper grounding, have an HP-authorized reseller install the part.

NOTE:

For more information on static electricity, or assistance with product installation, contact your HP-authorized reseller.

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